ZOOLOGICA

SCIENTIFIC CONTRIBUTIONS OF THE NEW YORK ZOOLOGICAL SOCIETY

FROM THE TROPICAL RESEARCH STATION IN BRITISH GUIANA

VOLUME III. NUMBERS 22 AND 23

(Tropical Research Station Contribution Numbers 142 and 143)

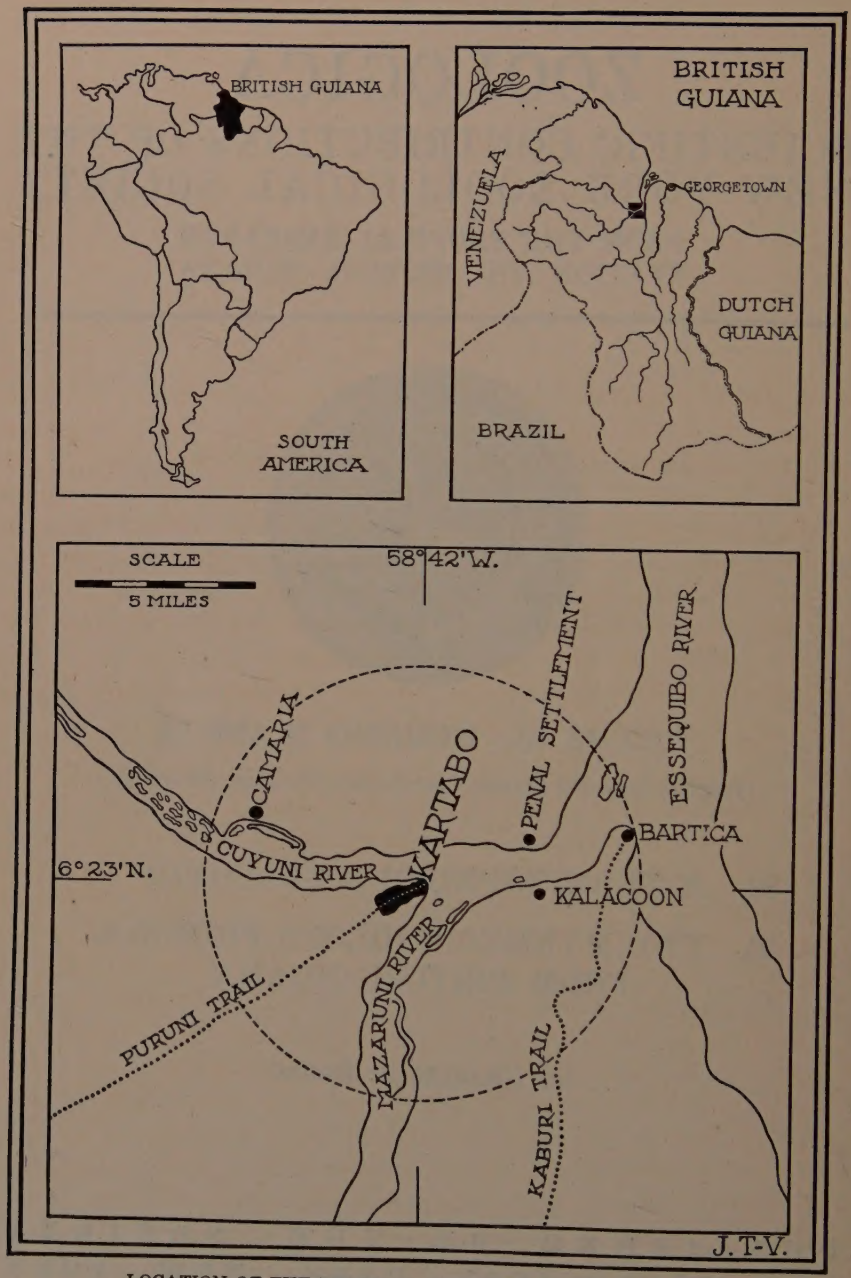
22. A TERMITOPHILOUS BRACONID

23. TWO MYRMECOPHILOUS PHORIDÆ FROM BRITISH GUIANA

By CHARLES T. BRUES

PUBLISHED BY THE SOCIETY
THE ZOOLOGICAL PARK, NEW YORK

OCTOBER 1, 1923



LOCATION OF THE TROPICAL RESEARCH STATION OF THE NEW YORK ZOOLOGICAL SOCIETY

The circle represents a radius of six miles.

First form on press October 11, 1923

TERMITOBRACON, A TERMITOPHILOUS BRACONID FROM BRITISH GUIANA[1]*

By CHARLES T. BRUES.

(Figs. 42-43)

In the autumn of 1920, I received from Mr. Alfred Emerson a most extraordinary termitophilous Hymenopteron of the parasitic family Braconidæ. During the course of his extensive studies on termites and the other insects which occur with them, carried on in the vicinity of the tropical station of the New York Zoological Society, at Kartabo, British Guiana, Mr. Emerson obtained specimens of both sexes of this strange insect. From observations on its behavior and the reactions of the termites he assures me that it is undoubtedly a true termitophile and his conviction is fully borne out by its structural characteristics.

The males have the eyes and wings greatly reduced in size and the neuration of the latter are consequently highly modified. From observation Mr. Emerson found that they made no attempts to fly, but moved slowly about the nest among the termites which displayed no hostility, but appeared rather to be friendly toward them. A worker termite was once observed by Mr. Emerson to lick one of the females. The females, in contrast to the males, have the wings fully developed and are undoubtedly able to fly readily. This disparity is in itself very unusual, as there are scarcely any Hymenoptera, or other insects for that matter, in which the females are fully winged and the males apterous or partially so. A similar condition does exist, however, in the fig insects of the family Agaonidæ where the females are winged and the males apterous and a group Idarninæ of a related family of Chalcid-flies, the Calli-

---

[1] Contribution from the entomological laboratory of the Bussey Institution, Harvard University, No. 184.

* Tropical Research Station, Contribution Number 142.

momidæ, parasitic on the fig insects show a similar condition. Another family of Chalcid flies, the Eulophidæ, contains Melittobia, a widely distributed genus parasitic on various wasps and bees which is subapterous in the male although the female shows no reduction in wing size, while another Eulophid, Perissopterus, parasitic on scale insects, sometimes has subapterous males. In a few other Hymenoptera the male is dimorphic or polymorphic in the development of the wings. Thus the males of a certain species of Pezomachus (*P. flavocinctus* Ashm.) belonging to the Ichneumonidæ have three types of males, a fully winged one, a subapterous one and an entirely wingless one, but in this case the female is apterous. Such is the case also in the Bethylid, *Cephalonomia urichi*, which I have recently shown to have both winged and wingless males. On the other hand the Trichogrammatid Oöphthora has winged females and both alate and apterous males Still more recently Picard has shown that a Braconid (*Sycosoter lavagnei*) parasitic on *Hypoborus ficus* has winged and apterous forms, both sexes being represented by individuals of each type. He has shown further, in this case, that while the four forms occur at the same time, the winged ones are most abundant in warm weather and the wingless ones most numerous in the spring and autumn, while only apterous ones occur during the season of hibernation. Whether the present Braconid may also be dimorphic cannot be stated, but on account of the rarity of such an occurrence, there seems to be no valid reason for assuming that it is.

The male is also much lighter in color than the female, and such is the case also in Melittobia, in at least some of the species.

Most termitophilous insects are physogastric, having the abdomen considerably swollen or enlarged and frequently turned either upwards or downwards, out of the plane in which it normally rests. Termitobracon shows no distinct physogastry in either sex, but the abdomen of the male is perhaps somewhat larger than usual in other male Braconidæ. It is, however, distinctly curved downwards, and when the body is thus partially curled, the aborted wings rest upon its dorsal

surface with their surface bent in conformity to the latter. This bending takes place almost entirely at two points, the base and apex of the stigma.

Termitobracon appears to be the first Hymenopteron ever found as a termite guest[2], and is possibly parasitic upon the termites themselves although it is, of course, quite possible that it may attack some other insect which occurs regularly in their nests. I have examined several thousand termites taken from the nest in which the parasites occured, but have been unable to find any parasitic larvae either in the bodies of the termites, attached to them, or free in the alcohol, so that the host of Termitobracon must remain doubtful. Its size is, however, just about that of the larger termite workers, as might very likely be the case if it should be an internal parasite.

Termitobracon gen. nov.

Female.—Body, including the legs and wings, densely clothed with very fine yellowish hairs. Head strongly transverse; eyes small, hairy; antennae 14-jointed, filiform, the scape short, simple at tip and very closely united with the pedicel; flagellum beyond the third joint marked by fine longitudinal ridges, the first three joints strongly emarginate at tip; ocelli minute, in a small triangle; clypeus semicircular, not emarginate, not horned nor toothed; mandibles small, acute, without teeth near apex. No parapsidal furrows; propodeum simple, convex. Abdomen short, oval, with seven well developed segments, first segment with lateral carinae, but otherwise not sculptured; ovipositor issuing near the middle of abdomen, but not extending far beyond the apex, sheaths slender, but dilated near the apex. Legs rather stout, the basal and apical joints of tarsi elongated, the others very short. Wings rather large,

---

[2] Since this was written Cushman (Proc. Entom. Soc. Washington, vol. 25, p. 54, 1923), has described a genus of Braconidæ, Ypsisterocerus, represented by two species collected in termite nests by Dr. W. M. Mann in Bolivia. Ypsistrocerus and Termitobracon are quite closely related, but differ in a number of good structural characters in spite of the fact that both occur in the nests of the same species of termite. Cushman has made Ypsistrocerus the type of a new subfamily (Ypsistrocerinae) to which Termitobracon must now be added.

stigma broad, dark, but not heavily chitinized, the radial cell broad, attaining the wing tip; three cubital cells although the transverse cubiti are in great part hyaline; nervulus strongly postfurcal; nervellus interstitial; hind wing without nervulus or marginal vein.

FIG. 42. *TERMITOBRACON EMERSONI* SP. NOV.
Female.

Male.—Subapterous, the wings greatly reduced in size, curved over the abdomen at rest and distinctly bent at each end of the stigma, reaching just beyond middle of abdomen. Eyes minute, ocelli wanting. Legs stouter than those of the female. Color of body much lighter.

Type, the following species:

Termitobracon emersoni sp. nov.

(Figs. 42-43)

Female (Fig. 42).—Length 2.2-2.3 mm. Fuscous, the head black, except about the mouth; thorax distinctly darker than the abdomen, especially in front above; legs brownish yellow, the tibiae and tarsi lighter than the femora. Antennae yellowish,

the first three joints of flagellum much darkened and the last seven joints very pale; clypeus and mandibles, except their black tips, honey-yellow; propleura on anterior edge and spot on mesopleura below, yellow; propodeum anteriorly and at the sides stained with yellow; abdomen darker at the sides of the first segment and along the posterior margins of the second and fourth segments; ovipositor black, its sheaths pale; wings brownish-hyaline, a weak cloud in the upper part of the radial cell; venation dark fuscous. Head two and one half times as broad as thick antero-posteriorly, rounded and narrowed behind the eyes, which are broadly oval, quite small, as long as the

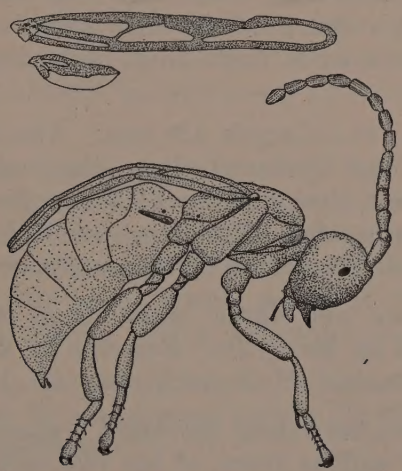


FIG. 43. *TERMITOBRACON EMERSONI* SP. NOV.
Male.

scape of the antenna; antennae 14-jointed; scape short, the pedicel closely attached to it, rounded; first joint of flagellum short, second to fourth longer, about twice as long as broad; following quite distinctly oval the last pointed at tip. Malar space twice as long as the eye; surface of head smooth; ocelli forming an equilateral triangle. Mesonotum and scutellum smooth and shining, not very strongly convex. Propodeum smooth above, without sculpture. First abdominal segment carinate at the sides, the space between the carinae twice as broad as long; surface smooth and polished as is the remainder of the abdomen; second and third segments of equal length,

together as long as broad, the articulation between them very faint; fourth and fifth segments equal in length and width, each slightly shorter and broader than the third; sixth much longer and narrower; seventh half the length of the sixth; eighth minute; ovipositor but slightly exserted. First section of radius very short; one-fourth as long as the second which is slightly shorter than the third; radial cell attaining the wing tip; cubitus arising at the middle of the basal nervure, the transverse cubiti not complete, the first pigmented, except below, the second indicated by the absence of trichiation; nervulus entering near the middle of the discoidal cell; nervellus interstitial; hind wing with only the basal and submedian vein and a stump of the anal, nervulus wanting; subdiscoidal indicated as a faint cloud extending to the wing margin.

Male (Fig. 43).—Length 1.9 mm. Almost entirely light testaceous, the head blackened above, the carinae on the first abdominal segment black and the hind margins of the third to fifth segments infuscated. Eyes much smaller, scarcely as long as the diameter of the pedicel of the antennae.

Four females and three males from Kartabo, British Guiana, collected by Mr. Alfred Emerson in a nest of *Nasutitermes* (N.) *ephratae* (Holmgren), July 28, 1920.

Mr. Cushman has kindly compared a specimen of Termitobracon with the unique types of his two species of Ypsistrocerus and considers the two genera to be undoubtedly closely related in spite of many obvious differences, some of which may be tabulated as follows:

Maxillary palpi 2-jointed; labial palpi apparently wanting; joints of the filiform antennal flagellum all of similar form; first and second cubital cells fused (female); Stigma narrow (female) ..... Ypsistrocerus Cushman.

Maxillary palpi 3-jointed; labial palpi 2-jointed; basal three joints of antennal flagellum each with an oblique emargination at apex, following joints oval; first and second cubital cells separated (female); Stigma broad (female) ..... Termitobracon Brues.

TWO MYRMECOPHILOUS PHORIDÆ FROM BRITISH GUIANA[1]*

By CHARLES T. BRUES

(Fig. 44).

In September, 1920, Mr. William Beebe, director of the Tropical Research Station of the New York Zoological Society at Kartabo, British Guiana, in company with Mr. Alfred Emerson, obtained two remarkable species of Phoridæ along the trails of the legionary ant, *Eciton burchelli*. This ant is abundant in the region of the Station and like the other species of the genus undoubtedly harbors many myrmecophilous insects of various kinds.

On examining the specimens, which they kindly sent me for study, I find that one form represents a new genus, quite different from any of those heretofore described and that the second is identical with a species first made known only a few years ago from Southern Brazil, where it was found with another species of Eciton having somewhat similar habits.

As is the case with many of the myrmecophilous Phoridæ, only the wingless or subapterous female of these two species has so far been obtained.

Apterophora gen. nov.

Female.—Wingless, but with the eyes large, half as high as the side of the head; ocelli present; antennæ small, round; palpi simple, with stout bristles at apex; proboscis slender, four times as long as the head-height, geniculate at the middle, with the apical half directed forward. Three transverse series of frontal setæ, the lowest two proclinate, close together; a pair just above these erect or slightly proclinate; upper row of four, two of which are next to the ocelli. Head, seen from above,

[1] Contribution from the entomological laboratory of the Bussey Institution, Harvard University, No. 185.

* Tropical Research Station, Contribution Number 143.

much produced medially in front. Dorsum of thorax somewhat wider than long, no scutellum; a large humeral bristle on each side and a posterior row of stout bristles; pleura oblique, fully twice as high as the length of the dorsum. Abdomen with five very heavily chitinized black dorsal plates which are only slightly separated by pale membrane in engorged specimens; ventral surface membraneous, nearly white, without any chitinous plates. Legs rather slender, the anterior coxæ as long as the femora; all tibiæ without preapical spines or bristles.

Type *Apterophora caliginosa* sp. nov.

This is similar to Enderlein's genus Crepidopachys (Enderlein '12) from Southern Brazil on account of its long proboscis, but the type of this is a winged insect and it is difficult to make further comparisons. The sex is not given by Enderlein, and if his description should apply to a male, the genus might be related to the present one. I suspect that his examples were females, however, from the description of the apex of the abdomen and particularly the long proboscis, in spite of the fact that the greatly thickened costa suggests that they might be males. Even if the latter should be the case, I do not believe that the two could possibly be congeneric or even closely related, as the long proboscis is the only striking similarity.

Among the genera known to have wingless or subapterous females, two have a similarly lengthened proboscis. Psyllomyia Loew (Loew '57, Wassman '00; Brues '01; Schmitz '14) a guest in the nests of *Dorylus helvolus* in South Africa has a long, slender, geniculate proboscis which is, however, not much longer than the head. It has also a dark, heavily chitinized abdomen like Apterophora, but the wings are present as large broad pads. The eyes are much smaller, the ocelli absent, and the legs very stout in Psyllomyia. In the absence of males, therefore, it seems unwise to regard them as possibly congeneric.

Rhynchomicropteron Annandale (Annandale '12; Schmitz '14 and '15) known by two species, one from Ceylon as a guest of *Lopopelta ocellifera* Rog. and another from Bombay as a guest of *Prenolepis longicornis* Latr., is very similar in some respects to Apterophora; it has a very long, slender, geniculate

proboscis and a similarly formed head and thorax. It differs greatly in having well developed digitiform wing pads, in having the ocelli absent, and is practically blind, as the compound eyes are mere vestiges, each composed of half a dozen separate ommatidia. The most striking differences are seen in the abdomen which is entirely membranous, without any clearly chitinized plates, and in the dorsum of the mesothorax which bears a longitudinal impression and distinct median suture, something of very rare occurrence in insects.

Apterophora caliginosa sp. nov.

(Fig. 44).

Female.—Length 1.7-1.9 mm. Head, thorax, abdominal plates, and four posterior coxæ deep, shining black; legs and proboscis honey-yellow; antennæ pale yellow; palpi fuscous; membranous parts of abdomen white, with a slightly sooty tinge. Head distinctly wider and longer than the thorax, the front obtusely triangularly produced between the antennæ, frontal bristles well developed, but not very strong. Eyes oval, contiguous, with the antennal excavation and the posterior margin of the head; cheek one-third the height of the eye, each with a tuft of four or five small bristles anteriorly above the insertion of the palpus, but without bristles behind; postocular bristles weak. Antennæ round, small, with apical, strongly pubescent arista which is one-third longer than the head-height. Proboscis stout at the base, but narrowed and very slender beyond; geniculate just before the middle, the basal part straight, at rest bent somewhat beneath the body and extending to the tip of the front coxæ; apical part curved, projecting forward with the upper margin convex; tip obliquely truncate, with a few minute bristles. Palpi with a few moderately large bristles below near apex. Surface of head impunctate. Mesonotum one-fourth wider than long; anterior margin arcuately excavated, the humeri rounded; spiracles visible from above, just behind the humeri; posterior margin slightly convex. Macrochaetæ not strong, disposed as follows: a weak post-humeral one, a series of six longer ones along the posterior margin, one at each extreme lateral angle and four between these, the

median two farther apart than the others. Surface indistinctly punctate. Abdomen highly convex above, the plates densely and finely punctate; first (visible) one the largest, nearly three times as long and wide as the mesonotum, almost twice as broad behind as in front, the posterior margin nearly straight and fringed with long, bristle-like hairs; second plate only half

FIG. 44. *APTEROPHORA CALIGINOSA* SP. NOV.

as long as the preceding, but of equal width, similarly punctate and fringed along the posterior margin; third distinctly shorter and narrower, fringed; fourth (really the fifth) segment smaller, the gland opening filling a large anterior emargination of the plate; fifth very small, not fringed like the others; apex of abdomen of the usual tubular, retractile form. All of the abdominal plates clothed with fine, pale, glistening pubescence. Legs slender, although the anterior tibiæ are slightly thickened; spurs of four posterior tibiæ small, but distinct; hind metatarsi each with seven transverse rows of dense fine recumbent bristles.

Described from two specimens, both the type and paratype, as well as several other specimens which I have not examined, taken at the same time near a trail of the army ant, *Eciton burchelli,* at Kartabo, British Guiana. Concerning their relationship to the ants, Mr. Emerson writes that the first specimen

was seen by Mr. Beebe in the ant trail and that further careful search was rewarded by the finding of several others.

Ecitophora comes Schmitz.

Zool. Jahrb. Abth. f. Syst., vol. 36, p. 524 (1914).
Brues, Psyche, vol 30, p. 21 (1923).

Three females from Kartabo, British Guiana taken at the same time that the previous Phorid was obtained, prove to belong to this species.

The types were found with *Eciton predator* Sm. at São Leopoldo, Rio Grande do Sul in southern Brazil, but the Guiana examples agree in all details with Schmitz's description and excellent figures.

It is evident, therefore, that this myrmecophile is widely distributed in tropical South America and that it occurs with at least two species of Eciton, *E. burchelli* and *E. predator*.

Ecitophora is much like Ecitomyia Brues, with which Schmitz has compared it, and differs in only a few details. In view of the numerous monotypic genera in this group and as Schmitz has already erected the genus Ecitophora for this species I have used the name although I am by no means satisfied that the two genera can be maintained. Nevertheless Ecitophora is readily separable by the presence of ocelli and the complete absence of the plate on the third abdominal segment, although the minute fourth and fifth plates are fully chitinized and fully colored.

BIBLIOGRAPHY

Annandale, N.
1912. A Micropterous Fly of the Family Phoridæ Associated with Ants. Spolia Zeylandica, vol. 8, pp. 85-89, pl. 1

Brues, C. T.
1901. Two New Myrmecophilous Genera of Aberrant Phoridæ from Texas. American Natural, vol. 35, pp. 337-356, 11 figs.

Enderlein, G.
1912. Die Phoriden Süd-Brasiliens. Stettiner Entom. Zeitg., pp. 16-45, 2 figs.

Loew, H.

1857. *Psyllomyia testacea*, eine neue Gattung der Phoriden. Wiener Entom. Monatsscher., vol. 1, pp. 54-56, 1 pl., 22-25 figs.

Schmitz, H.

1914. Die myrmecophilen Phoriden der Wasmann'schen Sammlung. Zool., Jahrb., Abth. f. Syst., vol. 37, pp. 509-566, 11 figs., 2 pls.

1915. Berichtigung und Ergänzungen zu den "Myrmecophilen Phoriden der Wassmannschen Sammlung." Schmitz 1914. Deutsch. Entom. Zeitschr., vol. 5, pp. 503-504.

Wasmann, E.

1900. Neue Dorylinengäste aus dem neotropischen und dem äthiopischen Faunengebiet. Zool. Jahrb., Abth. f. Syst., vol. 14, pp. 215-289, 2 pls.